ABSTRACT

In a microwave plasma processing apparatus, a metal made lattice-like shower plate 111 is provided between a dielectric material shower plate 103, and a plasma excitation gas mainly an inert gas and a process gas are discharged form different locations. High energy ions can be incident on a surface of the substrate 114 by grounding the lattice-like shower plate. The thickness of each of the dielectric material separation wall 102 and the dielectric material at a microwave introducing part is optimized so as to maximize the plasma excitation efficiency, and, at the same time, the distance between the slot antenna 110 and the dielectric material separation wall 102 and a thickness of the dielectric material shower plate 103 are optimized so as to be capable of supplying a microwave having a large power.